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Ionospheric Data Report – February 1964

IONOSPHERIC DATA: BANGKOK, THAILAND

Compiled by: VICHAI T. NIMIT

Prepared for:

U.S. ARMY ELECTRONICS LABORATORIES
FORT MONMOUTH, NEW JERSEY

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FOR THE
THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND

STANFORD RESEARCH INSTITUTE

MENLO PARK, CALIFORNIA

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ILLUSTRATIONS

I INTRODUCTION

Ionospheric observations are being carried out at the Laboratory of the Military Research and Development Center at Bangkok, Thailand, a joint United States-Thailand organization. A Model C-2 vertical-incidence sounder supplied and operated by the United States Army Radio Propagation Agency has been installed there. Table I gives pertinent information about the site.

Table I

VERTICAL-INCIDENCE SOUNDER SITE
AT BANGKOK, THAILAND

Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
13.73°N	100.57°E	2.5°N	169.83°E

Dip angle: 10°N

Distance from dip equator: 450 km

Equipment:

Instrument: Type C2 (automatic)

PRF: 60 pps

Frequency sweep time: 30 sec

Frequency sweep range: 1 to 25 Mc

Pulse duration: 50 μsec

Peak pulse power: approximately 10 kw.

The cooperation and participation of staff members of the Thailand Ministry of Defense and the support of the United States Advanced Research

Projects Agency, the United States Army Electronics Laboratories, and the United States Army Radio Propagation Agency made it possible for the data presented in this report to be accumulated.

II TERMINOLOGY AND SYMBOLS

The terminology and symbols used in this data report are in accordance with the conventions established by the World Wide Soundings Committee.[1]

A. TERMINOLOGY

f_oF_2 f_oF_1 f_oE	The ordinary wave critical frequency for the F_2 and F_1 layers and the E region, respectively.
f_oE_s	The ordinary wave top frequency corresponding to the highest frequency at which a mainly continuous E_s trace is observed.
f_bE_s	The blanketing frequency of an E_s layer, i.e., the lowest ordinary wave frequency at which the E_s layer begins to become transparent. (This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.)
f_{min}	The frequency below which no echoes are observed.
M(3000)F_2	The maximum usable frequency factor for a path of 3000 km for transmission by the F_2 layer.
h'F_2	The minimum virtual height of the ordinary wave trace for the highest stable stratification in the F region.
h'F	The most significant F-region virtual height parameter, that for the lowest F-region stratification. (Thus h'F is identical with the current h'F_2 when F-region stratification is absent, i.e., at night, and with current h'F_1 when F_1 stratification is present.)

[1] W. R. Piggott and K. Rawer, URSI Handbook of Ionogram Interpretation and Reduction of the World Wide Sounding Committee (Elsevier Publishing Company, Amsterdam, London, New York, 1961).

B. DESCRIPTIVE LETTERS

Certain effects observed on ionograms may make it difficult or impossible to obtain accurate numerical values. The descriptive letters listed below, when used alone indicate, in general, the presence of a phenomenon that may have influenced the measurement. Qualifying letters (Sec. C) indicate the nature of the uncertainty.

- **A** A lower thin layer present, e.g., E_s
- **B** Absorption in the vicinity of f_{min}
- **C** Any non-ionospheric reason
- **D** The upper limit of the normal frequency range
- **E** The lower limit of the normal frequency range
- **F** Spread echoes present
- **G** Ionization density of the layer too small for measurement
- **H** Stratification present
- **L** No sufficiently definite cusp between layers of the trace
- **M** Ordinary and extraordinary components indistinguishable
- **N** Conditions such that the measurement cannot be interpreted
- **O** Measurement referring to the ordinary component
- **R** Attenuation in the vicinity of a critical frequency
- **S** Interference or atmospherics
- **T** Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- **V** Forked trace
- **W** Echo lying outside the height range recorded
- **X** Measurement referring to the extraordinary component
- **Y** Intermittent trace
- **Z** Third magneto-ionic component present.

C. QUALIFYING LETTERS

- **D** Greater than. . .
- **E** Less than. . .

I An interpolated value

J Ordinary component characteristic deduced from the extraordinary component

O Extraordinary component characteristic deduced from the ordinary component

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful

U Uncertain numerical value

Z Measurement deduced from the third magneto-ionic component.

D. DESCRIPTION OF STANDARD TYPES OF E_s

The eight standard types of E_s are identified by lower-case letters: f, l, c, h, q, r, a, and s. These letters suggest the corresponding names, flat, low, cusp, high, equatorial, retardation, auroral, and slant, respectively, but are not restrictive. The letter n is used to designate an E_s trace that does not correspond to one of the eight types. The classifications are:

f An E_s trace showing no appreciable increase of height with frequency, usually relatively solid at most latitudes. (This classification may be used only at night; it appears that flat E_s traces observed in the daytime are classified according to their virtual height: h or l.)

l A flat E_s trace at or below the normal E-region minimum virtual height in the day or below the E-region minimum virtual height at night.

c An E_s trace showing a relatively symmetrical cusp at or below f_0E. (This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing—usually a daytime type.)

h An E_s trace showing a discontinuity in height with the normal E-region trace at or above f_0E and an asymmetrical cusp. (The low-frequency end of the E_s trace lies clearly above the high-frequency end of the normal E trace—usually a daytime type.)

q An E_s trace that is diffuse and nonblanketing over a wide frequency range, the spread being most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

r An E_s trace that is nonblanketing over part or all of its frequency range, showing an increase in virtual height at the high-frequency

end similar to group retardation. (This is distinguished from the usual group retardation—as in the case of an occulting thick E region—by the lack of group retardation in the F traces at corresponding frequencies and the lack of complete blanketing.)

a An E_s pattern having a well-defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. (These sometimes extend over several hundred kilometers of virtual height.)

s A diffuse E_s trace that rises steadily with frequency, usually emerging from another type of E_s trace. (The rising trace alone is classified as s; the horizontal trace is classified separately. At high latitudes, the slant trace usually starts to rise from a horizontal E_s trace, such as l or f, at frequencies that greatly exceed the E-region critical frequency, e.g., about 6 Mc; whereas at low latitudes it usually rises from equatorial-type E_s, q, c, or h, at frequencies near the regular E critical frequency. Type s is never used to determine f_o E unless echoes clearly identifiable as E_s echoes are seen.)

n An E trace that cannot be classified as one of the standard types. (This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.)

E. MULTIPLE REFLECTIONS FROM E_s

When the ionogram shows the presence of multiple reflections from E_s, the number of traces seen will be recorded with the letter indicating the type.

Characteristic: f_{min}

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	1
1	E015S	E	E017S	E016S	E018S	S	S	E020S	E024S	E030S	E027S	E034S	E030S	E029S	E0
2	018*	E014S	011	E	012	S	S	E018S	E022S	E023S	E028S	E029S	E030S	E029S	E0
3	E018S	E	E016S	E016S	E	E016S	S	E025S	E023S	E023S	E028S	E027S	E030S	E028S	E0
4	018	012	013	E	012	E017S	S	E030S	E020S	E023S	E026S	E030S	E028S	E030S	0
5	E016S	E017S	017	013	013	E016S	S	E019S	E023S	E023S	E027S	E030S	E029S	E029S	E0
6	E015S	012	012	E	E017S	S	S	E019S	E020S	E022S	E025S	E026S	E030S	035	E0
7	E017S	E016S	012	E	B	S	S	E028S	E018S	E023S	E024S	E029S	E025?	E028S	0
8	E015S	E016S	E017S	E016S	E017S	E017S	S	E025S	E020S	E022S	E027S	E027S	E030S	E029S	E0
9	E017S	E016S	E017S	E017S	012	E016S	E017S	E024S	E028S	E028S	034	E027S	E020S	E024S	0
10	E016S	E	E016S	013	E016S	E017S	S	E027S	E027S	E028S	E027S	E030S	E033S	E027S	0
11	E016S	E016S	E016S	E016S	B	E016S	E018S	E018S	E023S	E022S	E026S	E027S	E029S	040	0
12	E017S	018	E016S	E	013	E016S	S	E020S	E028S	E030S	030	E034S	E035S	030	0
13	E016S	E017S	E017S	014	E	E014S	E019S	E030S	E026S	E023S	E025S	E025S	E030S	035	0
14	E016S	012	014	012	012	E017S	E018S	025	029	E027S	E027S	036	E029S	E040S	0
15	E016S	E017S	E	E	E	E016S	S	E018S	E019S	E023S	E025S	E028S	E030S	E030S	0
16	E018S	E017S	E017S	012	013	E017S	S	E020S	E022S	E023S	E027S	E027S	035	E029S	E0
17	E015S	E016S	E	E	E017S	E017S	S	C	C	E022S	E026S	E029S	044	040	C
18	E016S	011	015	E016S	E017S	E017S	E017S	E023S	E029S	E022S	C	C	C	C	0
19	E015S	E015S	015	015	E012S	E019S	S	E022S	E023S	E025S	E026S	E026S	E028S	E032S	0
20	E020S	E017S	E017S	E017S	E015S	E017S	E017S	E018S	E027S	E029S	033	035	E029S	034	0
21	E016S	E016S	015	E	E016S	E016S	E019S	E019S	E025S	E025S	E029S	E040S	E026S	C	C
22	E017S	E015S	E	E	E017S	E017S	019	E027S	E023S	E023S	E027S	E030S	E038S	036	E0
23	E015S	017	012	014	012	E014S	E017S	E018S	E027S	E029S	033	030	035	034	0
24	E017S	E017S	018	011	011	E016S	E018S	E019S	E027S	E027S	E027S	E030S	035	036	0
25	E015S	E014S	E016S	E014S	E012S	E017S	018	E017S	E017S	E018S	E030S	E027S	E040S	E030S	0
26	018	020	014	016	E012S	E017S	E017S	E023S	E028S	032	034	E023S	035	039	0
27	012	018	017	012	012	E014S	S	E023S	E029S	E026S	E029S	E028S	040	038	0
28	E019S	E017S	E017S	015	017	E015S	S	E027S	029	E030S	040	037	E039S	E028S	0
29	017	E015S	014	E016S	017	E019S	020	E030S	E040S	E042S	E043S	E042S	E046S	E050S	E0
30															
31															
Median	016	016	016	015	014	017	018	023	025	023	027	029	030	030	0
Count	29	26	26	20	24	25	13	28	28	29	28	28	28	27	
UQ	017	017	017	016	017	017	018	026	028	029	030	031	035	036	0
LQ	015	015	014	013	012	016	017	019	022	023	027	027	029	029	0
QR	2	2	3	3	5	1	1	7	6	6	3	4	6	7	

*Tabulation of 018 = 1.8 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
E024S	E030S	E027S	E034S	E030S	E029S	E024S	E023S	E021S	E019S	E019S	E018S	E018S	E018S	E018S	020
E022S	E023S	E028S	E029S	E030S	E029S	E018S	E024S	E022S	E026S	E018S	021	E019S	021	019	E018S
E023S	E023S	E028S	E027S	E030S	E028S	E030S	E022S	E023S	E020S	E018S	E017S	E017S	E017S	E018S	019
E020S	E023S	E026S	E030S	E028S	E030S	030	025	023	E023S	E017S	019	023	019	E017S	E017S
E023S	E023S	E027S	E030S	E029S	E029S	E026S	030	025	024	E019S	E017S	E020S	E017S	E017S	E017S
E020S	E022S	E025S	E026S	E030S	035	E030S	E023S	021	E026S	E024S	E018S	E017S	E017S	E022S	022
E018S	E023S	E024S	E029S	E025S	E028S	034	034	029	E026S	E021S	021	021	E018S	E018S	E017S
E020S	E022S	E027S	E027S	E030S	E029S	E026S	025	023	026	E018S	E022S	020	E018S	017	019
E028S	E028S	034	E027S	E020S	E024S	024	020	032	E026S	E019S	E018S	E017S	E017S	E018S	E018S
E027S	E028S	E027S	E030S	E033S	E027S	033	033	E017S	E017S	E019S	020	023	020	E018S	019
E023S	E022S	E028S	E027S	E029S	040	033	024	E025S	E025S	025	E024S	021	E017S	019	E018S
E028S	E030S	030	E034S	E035S	030	035	033	030	E023S	E018S	E018S	E018S	E018S	E018S	022
E026S	E023S	E025S	E025S	E030S	035	032	024	E018S	E021S	E017S	E018S	E017S	E026S	E018S	E018S
029	E027S	E027S	036	E029S	E040S	034	035	024	E023S	E023S	E022S	E018S	022	E018S	E018S
E019S	E023S	E025S	E028S	E030S	E030S	035	027	028	020	E018S	E019S	E018S	021	E018S	022
E022S	E023S	E027S	E027S	035	E029S	E029S	033	E029S	E027S	E017S	E018S	E017S	E017S	E017S	E018S
C	E022S	E026S	E029S	044	040	C	C	C	C	C	E017S	E019S	E018S	E018S	E017S
E029S	E022S	C	C	C	C	035	030	E025S	E026S	E017S	E017S	E017S	E017S	E017S	020
E023S	E025S	E026S	E026S	E028S	E032S	033	032	E026S	E023S	E022S	E017S	E018S	E018S	E017S	022
E027S	E029S	033	035	E029S	034	030	E029S	E026S	021	021	E024S	E017S	020	E018S	E017S
E025S	E025S	E029S	E040S	E026S	C	C	C	C	C	C	C	E017S	E017S	E025S	E017S
E023S	E023S	E027S	E030S	E038S	036	E028S	030	032	027	020	E018S	E017S	E018S	E017S	E017S
E027S	E029S	033	030	035	034	032	031	026	E020S	019	E017S	E017S	E017S	E017S	E017S
E027S	E027S	E027S	E030S	035	036	036	030	E027S	E022S	E018S	E024S	023	E017S	E017S	023
E017S	E018S	E030S	E027S	E040S	E030S	035	032	029	E020S	E018S	S	S	C	E017S	E020S
E028S	032	034	E023S	035	039	036	033	E023S	E023S	E020S	E025S	E027S	E026S	E017S	021
E029S	E026S	E029S	E028S	040	038	038	E028S	E025S	E027S	E030S	E024S	E030S	E040S	E025S	E018S
029	E030S	040	037	E039S	E028S	035	E040S	E034S	E035S	E033S	E028S	E034S	E032S	E024S	E017S
E040S	E042S	E043S	E042S	E046S	E050S	E045S	E040S	E035S	E029S	E025S	E025S	E035S	E020S	E035S	E017S
025	023	027	029	030	030	033	030	025	023	019	019	018	018	018	018
28	29	28	28	28	27	27	27	27	27	27	27	28	28	29	29
028	029	030	031	035	036	035	033	029	026	022	024	022	020	018	020
022	023	027	027	029	029	029	024	023	021	018	018	017	017	017	017
6	6	3	4	6	7	6	9	6	5	4	6	5	3	1	3

B

Characteristic: foF2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	029*	032	A	A	020M	S	S	D045S	D070C	072	D070C	066	063	068
2	045	040	027	023	016	S	S	D045S	J060S	067	067	D056S	060	061
3	049	045	042	U032F	025	019	S	043	J057S	070	D075S	A	061M	063
4	F	A	U024F	U031F	019	A	S	D050S	055	067	D070R	065M	052	056
5	042	036	034	023	022	D020S	S	D046S	056	069	075	077M	065	065
6	032	027	023	029	024	S	S	D045S	054	056	060	075	080	061
7	025	022	018	015	B	S	S	D045S	072	085	071	065	062	064
8	022	020	018	F	F	A	S	046	065	076	090	085	077	068
9	F	F	F	F	F	018	025	D045S	065	082	085	075	075	075
10	047	044	046	044	028	021	S	D046S	060	067	072	U067S	D067S	063
11	F	018	021	018	B	A	A	048	D060S	070	090	093	089	077
12	J059S	033	035	034	F	A	S	042	D057S	065	065	065	062	064
13	U048F	F	044	F	A	A	A	D047S	062	075	080	078	J078S	082
14	060	D057S	058	035	F	A	030	050	065	071	066	068	072	077
15	066	051	D035S	019	016	A	S	045	056	063	062	058	061	065
16	D055S	065	F	F	020	A	S	041	053	056	055	053	055	062
17	D048S	045	030	019	A	A	S	C	C	D070R	066	062	063	062
18	F	F	F	042	034	023	021	D045S	060	069	C	C	C	C
19	041	045	054	025	020	J017S	S	053	064	071	081M	067	D055S	061
20	F	F	F	F	F	027	A	D045S	D055S	055	067	069	075	080
21	F	F	050	042	036	026	U021S	055	073	D090S	090	D075S	067	C
22	043	038	034	026	023	018	A	J049S	075	D080S	085	D088S	075	067
23	050	048	048	038	029	022	020	053	068	067	085	D090S	D088S	D090R
24	050	055	055	052	053	051	037	J050S	067	075	077	075	077	076
25	065	F	053	043	031	026	021M	J050S	064	077	087	D090S	085	080
26	067	J060S	046	029	027	A	A	057	076	075	079	081	088	095
27	052	046	037	027	024	019	S	055	077	083	082	075	069	074
28	F	F	F	F	033	025	S	051	071	082	082	083	082	085
29	065	063	060	033	A	A	028	059	070	077	070	070	070	082
30														
31														
Median	049	045	037	030	024	022	023	046	064	071	075	075	070	068
Count	22	21	23	22	19	14	8	28	28	29	28	27	28	27
UQ	059	053	050	038	031	026	029	050	070	077	083	081	077	080
LQ	042	033	027	023	020	019	021	045	057	067	067	065	062	063
QR	17	20	23	15	11	7	8	5	13	10	16	16	15	17

*Tabulation of 029 = 2.9 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
D070C	072	D070C	066	063	068	073	080	083	073	073	066	064	057	D046S	047
J060S	067	067	D056S	060	061	066	075	079	075	J069S	062	053	D050S	D044S	044
J057S	070	D075S	A	061M	063	065	073	072	075	D075S	064	062	055	052	F
055	067	D070R	065M	052	056	055	058	069	069	076	062	053	D045F	F	U042F
056	069	075	077M	065	065	067	072	077	080	087	D070S	068	057	J049S	043
054	056	060	075	080	061	J058S	066	075	075	074	080	080	D045S	044	033
072	085	071	065	062	064	066	070	072	075	075	069	053	035	A	024
065	076	090	085	077	068	065	057	061	066	068	065	054	051	046	034
065	082	085	075	075	075	075	075	076	080	085	076	068	063	057	J051S
060	067	072	U067S	D067S	063	075	075	078	082	086	092	068	056	044	035
D060S	070	090	095	089	077	078	077	081	077	073	069	062	J059S	J059S	D056S
D057S	065	065	065	062	064	064	068	070	065	063	058	F	F	U051F	050
062	075	080	078	J078S	082	085	073	074	078	076	075	J070S	F	065	D068S
065	071	066	068	072	077	087	087	D088S	090	085	073	068	065	065	064
056	063	062	058	061	065	071	074	076	075	073	070	067	068	060	J060S
053	056	055	053	055	062	065	067	D068S	076	077	065	062	056	F	047
C	D070R	066	062	063	062	C	C	C	C	C	072	D060S	057	F	F
060	069	C	C	C	C	065	066	J069S	074	076	071	062	051	J049S	043
064	071	081M	067	D055S	061	A	064	067	070	072	078	073	065	052	046
D055S	055	067	069	075	080	D085R	085	085	085	D085S	080	072	063	U061F	F
073	D090S	090	D075S	067	C	C	C	C	C	C	C	071	065	U056S	J050S
075	D080S	085	D088S	075	067	065	071	075	077	087	D075R	077	064	056	050
068	067	085	D090S	D088S	D090R	076	076	075	080	D087S	D089S	083	072	056	A
067	075	077	075	077	076	075	075	073	069	067	066	F	U062F	U061F	066
064	077	087	D090S	085	080	080	082	078	081	D077S	S	S	C	U070S	D035S
076	075	079	081	088	095	D098R	D100R	D097S	D087S	068	062	064	D064S	065	066
077	083	082	075	069	074	077	076	075	080	081	D077S	F	F	F	F
071	082	082	083	082	085	088	090	090	D088S	D090S	D087S	D090S	085	085	F
070	077	070	070	070	082	085	092	100	D100S	D090S	D089S	D090S	U088F	F	J070S
064	071	075	075	070	068	074	075	075	077	076	071	068	059	056	047
28	29	28	27	28	27	26	27	27	27	27	27	25	25	23	23
070	077	083	081	077	080	080	080	081	081	085	078	072	065	061	060
057	067	067	065	062	063	065	068	072	074	073	065	062	053	049	042
13	10	16	16	15	17	15	12	9	7	12	13	10	12	12	18

B

Characteristic: M(3000)F2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	
1	340*	370	A	A	320M	S	S	S	C	290	C	280	270	
2	370	380	360	360	370	S	S	S	S	310	280	S	260	
3	340	360	360	U340F	340	370	S	360	S	330	S	A	255M	
4	F	A	U290F	U350F	410	A	S	S	300	330	R	220M	250	
5	340	340	340	360	360	S	S	S	350	320	300	250M	250	
6	340	330	300	350	360	S	S	S	390	340	340	310	260	
7	360	350	360	350	B	S	S	S	350	340	310	260	260	
8	330	370	320	F	F	A	S	330	310	310	320	300	260	
9	F	F	F	F	F	400	340	S	360	360	330	270	270	
10	350	330	350	380	375	350	S	S	330	300	270	U290S	S	
11	F	370	370	390	B	A	A	370	S	340	340	320	270	
12	S	360	360	390	F	A	S	350	S	290	280	280	260	
13	U320F	F	380	F	A	A	A	S	350	320	290	280	S	
14	330	S	380	340	F	A	310	340	280	250	270	280	285	
15	370	400	S	400	390	A	S	340	300	270	270	280	260	
16	G	350	F	F	360	A	S	350	300	270	270	265	280	
17	S	375	380	370	A	A	S	C	C	R	250	270	275	
18	F	F	F	390	380	370	340	S	360	350	C	C	C	
19	350	370	400	380	380	S	S	350	350	330	270M	270	S	
20	F	F	F	F	F	380	A	S	S	350	370	360	340	
21	F	F	370	360	340	370	U320F	360	340	S	340	S	270	
22	360	370	370	355	330	340	A	J350S	350	S	320	S	260	
23	350	350	360	370	395	380	360	370	370	360	350	S	S	
24	350	350	380	355	340	370	370	S	320	300	270	270	280	
25	350	F	390	380	360	360	340M	S	350	340	320	S	240	
26	360	S	390	300	290	A	A	340	310	270	280	300	290	
27	350	360	370	360	370	350	F	350	320	290	270	380	275	
28	F	F	F	F	370	350	S	350	300	280	290	380	280	
29	350	355	380	380	A	A	350	350	310	260	280	270	290	
30														
31														
Median	350	360	370	360	360	360	340	350	335	315	290	280	270	
Count	19	19	22	22	19	12	8	15	22	26	25	22	24	
UQ	360	370	380	380	380	370	355	360	350	340	330	290	280	
LQ	340	340	360	350	340	350	330	340	310	290	270	270	260	
QR	20	30	20	30	40	20	25	20	40	50	50	20	20	

*Tabulation of 340 = factor of 3.40.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
S	C	290	C	280	270	260	290	310	350	350	350	350	350	325	S	380
S	S	310	280	S	260	280	285	310	320	310	S	340	350	S	S	350
360	S	330	S	A	255M	250	270	310	330	330	S	350	330	330	370	F
S	300	330	R	220M	250	250	275	270	320	350	350	360	350	F	F	U350F
S	350	320	300	250M	250	245	260	310	330	330	340	S	360	330	S	380
S	390	340	340	310	260	260	S	270	320	320	320	330	360	S	340	370
S	350	340	310	260	260	255	260	290	300	330	340	370	380	380	A	340
330	310	310	320	300	260	260	240	250	290	280	290	330	350	350	350	350
S	360	360	320	270	270	280	250	270	280	300	340	350	360	335	330	S
S	330	300	270	U290S	S	280	260	290	310	330	330	360	375	380	340	350
370	S	340	340	320	270	285	270	290	280	290	290	320	330	S	S	S
350	S	290	280	280	260	265	290	280	300	310	300	320	F	F	U300F	320
S	350	320	290	280	S	290	240	260	290	310	310	300	S	F	320	S
340	280	250	270	280	285	280	300	320	S	320	290	290	310	300	320	330
340	300	270	270	280	260	280	290	290	290	280	290	315	320	340	360	S
350	300	270	270	265	280	270	270	290	S	310	320	330	340	350	F	350
C	C	R	250	270	275	270	C	C	C	C	C	290	S	310	F	F
S	360	350	C	C	C	C	260	280	S	310	330	350	350	360	S	350
350	350	330	270M	270	S	270	A	290	270	290	300	300	330	340	340	330
S	S	350	370	360	340	310	R	280	300	330	S	340	350	340	U330F	F
360	340	S	340	S	270	C	C	C	C	C	C	C	340	340	U360S	S
J350S	350	S	320	S	260	260	260	280	280	290	300	R	340	340	350	360
370	370	360	350	S	S	R	280	290	300	320	S	S	360	350	350	A
S	320	300	270	270	280	270	270	280	280	280	290	280	F	U280F	U310F	330
S	350	340	320	S	240	260	270	270	290	290	S	S	S	C	U350S	S
340	310	270	280	300	290	310	R	S	S	S	260	290	310	S	330	330
350	320	290	270	280	275	280	260	270	270	270	290	S	F	F	F	F
350	300	280	290	280	280	275	290	310	310	S	S	S	S	300	330	F
350	310	260	260	270	290	270	280	300	310	S	S	S	S	U300F	F	S
350	335	315	290	280	270	270	270	290	300	310	305	330	350	340	340	350
15	22	26	25	22	24	26	23	26	23	24	20	21	21	20	18	16
360	350	340	320	290	280	280	285	300	320	330	335	350	360	350	350	355
340	310	290	270	270	260	260	260	270	280	290	290	300	330	318	330	330
20	40	50	50	20	20	20	25	30	40	40	45	50	30	32	20	25

B

Characteristic: $h'F_2$

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 min

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12
1	-	-	-	-	-	-	-	-	-	-	370*	320	340
2	-	-	-	-	-	-	-	-	-	-	310	E400A	E400A
3	-	-	-	-	-	-	-	-	-	280	320	A	E400A
4	-	-	-	-	-	-	-	-	-	300	320	410	470
5	-	-	-	-	-	-	-	-	-	-	-	370	400
6	-	-	-	-	-	-	-	-	-	300	300	320	360
7	-	-	-	-	-	-	-	-	-	-	300	330	380
8	-	-	-	-	-	-	-	-	-	-	280	310	330
9	-	-	-	-	-	-	-	-	-	-	290	320	310
10	-	-	-	-	-	-	-	-	-	-	320	320	330
11	-	-	-	-	-	-	-	-	-	285	285	300	315
12	-	-	-	-	-	-	-	-	-	-	330	335	370
13	-	-	-	-	-	-	-	-	-	-	330	320	E310A
14	-	-	-	-	-	-	-	-	-	320	330	330	320
15	-	-	-	-	-	-	-	-	-	-	360	360	U400S
16	-	-	-	-	-	-	-	-	-	340	400	400	400
17	-	-	-	-	-	-	-	-	-	320	360	350	360
18	-	-	-	-	-	-	-	-	-	280	C	C	C
19	-	-	-	-	-	-	-	-	-	300	310	300	380
20	-	-	-	-	-	-	-	-	-	280	270	270	E300A
21	-	-	-	-	-	-	-	-	-	-	290	-	330
22	-	-	-	-	-	-	-	-	-	270	280	290	300
23	-	-	-	-	-	-	-	-	-	E240A	270	270	-
24	-	-	-	-	-	-	-	-	-	300	320	330	310
25	-	-	-	-	-	-	-	-	-	-	300	310	325
26	-	-	-	-	-	-	-	-	-	-	300	300	300
27	-	-	-	-	-	-	-	-	-	-	300	300	U330S
28	-	-	-	-	-	-	-	-	-	-	300	310	310
29	-	-	-	-	-	-	-	-	-	-	-	330	E310S
30													
31													
Median	-	-	-	-	-	-	-	-	-	300	305	320	330
Count	-	-	-	-	-	-	-	-	-	13	26	26	27
UQ	-	-	-	-	-	-	-	-	-	305	320	350	380
LQ	-	-	-	-	-	-	-	-	-	280	290	300	310
QR	-	-	-	-	-	-	-	-	-	25	30	50	60

*Tabulation of 370 = 370 km.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	370*	320	340	350	310	-	-	-	-	-	-	-	-	-
-	-	310	E400A	E400A	360	320	300	-	-	-	-	-	-	-	-
-	280	320	A	E400A	E400A	350	310	E300A	-	-	-	-	-	-	-
-	300	320	410	470	430	390	360	-	-	-	-	-	-	-	-
-	-	-	370	400	400	360	300	-	-	-	-	-	-	-	-
-	300	300	320	360	400	330	-	-	-	-	-	-	-	-	-
-	-	300	330	380	370	350	310	-	-	-	-	-	-	-	-
-	-	280	310	330	380	370	-	-	-	-	-	-	-	-	-
-	-	290	320	310	320	350	320	-	-	-	-	-	-	-	-
-	-	320	320	330	310	320	-	-	-	-	-	-	-	-	-
-	285	285	300	315	320	340	330	-	-	-	-	-	-	-	-
-	-	330	335	370	380	330	320	-	-	-	-	-	-	-	-
-	-	330	320	E310A	330	E400A	310	-	-	-	-	-	-	-	-
-	320	330	330	320	320	300	280	-	-	-	-	-	-	-	-
-	-	360	360	U400S	340	300	310	-	-	-	-	-	-	-	-
-	340	400	400	400	370	340	310	-	-	-	-	-	-	-	-
-	320	360	350	360	360	C	C	C	C	-	-	-	-	-	-
-	280	C	C	C	C	350	310	-	-	-	-	-	-	-	-
-	300	310	300	380	350	A	330	-	-	-	-	-	-	-	-
-	280	270	270	E300A	340	320	E300A	290	-	-	-	-	-	-	-
-	-	290	-	330	C	C	C	C	C	-	-	-	-	-	-
-	270	280	290	300	330	350	330	-	-	-	-	-	-	-	-
-	E240A	270	270	-	340	300	-	-	E320A	-	-	-	-	-	-
-	300	320	330	310	300	-	310	-	-	-	-	-	-	-	-
-	-	300	310	325	340	320	310	-	-	-	-	-	-	-	-
-	-	300	300	300	300	-	-	-	-	-	-	-	-	-	-
-	-	300	300	U330S	320	-	-	-	-	-	-	-	-	-	-
-	-	300	310	310	310	315	-	-	-	-	-	-	-	-	-
-	-	-	330	E310S	320	320	-	-	-	-	-	-	-	-	-
-	300	305	320	330	340	330	310	295	320	-	-	-	-	-	-
-	13	26	26	27	27	23	18	2	1	-	-	-	-	-	-
-	305	320	350	380	370	350	320	-	-	-	-	-	-	-	-
-	280	290	300	310	320	320	310	-	-	-	-	-	-	-	-
-	25	30	50	60	50	30	10	-	-	-	-	-	-	-	-

Characteristic: h'F

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	E220S	E220S	A	A	E330S	S	S	E220A	210*	200	180	180	170	170
2	E200S	E180S	215	210	E240S	S	S	E220A	E200A	E200A	E200A	A	A	A
3	E230S	210	210	230	E240S	E260S	S	E230S	E210A	A	A	A	A	A
4	U250F	A	E300S	210	200	A	S	E230S	E200A	210	E270A	180	160	160
5	E220S	E230S	E230S	210	E220S	E270A	S	210	E300A	E200A	180	E170A	E220A	160
6	E240S	E280S	E290S	E230S	E200S	S	S	220	210	E200A	200	E220A	170	160
7	E230S	E235S	250	E250E	B	S	S	E230S	200	E200A	200	190	160	E200A
8	E265S	E400A	E340S	E350S	U300F	A	S	E230S	E210A	E220A	200	200	E200A	170
9	245	U300F	U280F	U250F	U250F	E240S	E250S	225	210	200	195	180	180	E200A
10	E235S	E230S	E240A	200	E200S	E250S	S	E230S	E200S	180	180	E200A	180	E180A
11	E220S	E250S	E230S	E240S	B	A	A	220	210	E210A	200	E200A	E170A	E170A
12	200	E200S	E220S	200	200	A	S	225	220	E200S	E170S	180	200	180
13	E280S	E270S	E210S	200	A	A	A	E220S	220	210	E220A	A	A	A
14	E215S	E250A	E220A	230	220	A	E280S	E230S	E200S	200	E180S	170	E170B	E200B
15	E205S	200	180	200	200	A	S	E220S	200	200	200	180	180	170
16	220	U200F	190	170	210	A	S	230	210	200	180	180	180	170
17	200	200	E170A	E230S	A	A	S	C	C	200	180	E180A	B	E200B
18	E220S	200	200	200	E200S	E230S	E300S	220	220	200	C	C	C	C
19	E220S	E305S	180	200	200	300	S	220	220	210	E220A	E200A	E220A	A
20	250	250	220	210	E180S	E230S	A	210	E220A	A	A	A	A	A
21	E220S	E220S	200	210	E220S	E210S	E300S	E220S	220	210	300	E200S	E200A	C
22	E220A	E200S	E200A	E220S	E250S	E300S	A	E230S	220	210	E300S	180	170	170
23	E210S	E200S	200	200	200	E220S	E250S	220	E220A	A	A	A	320	A
24	220	220	210	210	230	E220S	E200S	220	200	200	180	180	170	180
25	220	200	200	200	200	E220S	E300B	220	215	200	190	E200S	E200S	180
26	E230A	200	E175S	E250S	E280S	A	A	E220S	210	200	180	E200A	180	180
27	200	220	200	210	220	E270S	B	220	210	210	200	200	185	E180B
28	E220S	210	200	190	200	E230S	S	E230S	210	200	E200B	190	E190S	185
29	E215S	210	200	E210A	A	A	E270A	E230A	E250S	E250S	E300S	E240S	S	S
30														
31														
Median	220	215	210	210	215	235	275	220	210	200	300	190	180	180
Count	29	28	28	28	24	14	8	28	28	26	25	23	22	20
UQ	232	243	230	230	240	270	300	230	220	210	200	200	200	182
LQ	215	200	200	200	200	220	250	230	200	200	180	180	170	170
QR	17	43	30	30	40	50	50	10	20	10	20	20	30	12

*Tabulation of 210 = 210 km.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
210*	200	180	180	170	170	165	E230A	E240A	230	225	E200S	E220A	E220A	E230S	E200S
200A	E200A	E200A	A	A	A	E180A	E180A	E200A	E200S	220	E210A	200	E210A	E225S	E230S
210A	A	A	A	A	A	A	A	A	230H	230	E205S	E200S	E220S	E210S	220
200A	210	E270A	180	160	160	170	160	200H	200	210	E200S	E200S	210	E220S	E210S
200A	E200A	180	E170A	E220A	160	160	E200A	200	200	235	E210S	200	E250A	E240A	E200S
210	E200A	200	E220A	170	160	170	160	210	E215S	E230S	230	210	205	E220A	E220A
200	E200A	200	190	160	E200A	170	190	E200A	E215S	220	200	200	E220A	A	E270A
210A	E220A	200	200	E200A	170	170	160H	E200S	220	E240S	E220S	210	E200S	215	E220S
210	200	195	180	180	E200A	E200A	E220A	E200S	E210S	220	200	E200S	E220S	E230S	E240S
200S	180	180	E200A	180	E180A	E180A	E180A	160H	E215A	E230A	220	200	200	E205A	E220S
210	E210A	200	E200A	E170A	E170A	E160A	160H	E170A	E210A	230	E220S	230	E210A	U230F	E250A
220	E200S	E170S	180	200	180	180	170	190	E220A	230	E250	U230F	210	E230S	E270A
220	210	E220A	A	A	A	A	E220A	E180A	E220A	240	240	280	U280F	E235A	E220S
200S	200	E180B	170	E170B	E200B	E170B	200	E200A	E205A	E230S	E230S	E230A	E240S	E250S	E240S
200	200	200	180	180	170	E160A	A	E200A	E200A	E240A	E240A	E230A	E200S	E220S	E210S
210	200	180	180	180	170	160	160H	200	200H	220	E230A	E220S	210	E220S	E225S
C	200	180	E180A	B	E200B	C	C	C	C	C	E250A	230	E240S	E240S	E250S
220	200	C	C	C	C	180	160	160H	210	220	200	E200S	E210A	E250A	E230S
220	210	E220A	E200A	E220A	A	A	A	E200A	E210A	E230S	E220S	E220S	E220A	E210A	E240B
220A	A	A	A	A	A	A	A	A	E220A	220	210	200	E210S	220	E220S
220	210	200	E200S	E200A	C	C	C	C	C	C	C	E210A	200	E210A	E230A
220	210	E200S	180	170	170	170	A	E200A	E200S	220	E220S	E200S	210	E210S	210
220A	A	A	A	320	A	E300A	240	E210A	A	220	220	210	200	200	A
200	200	180	180	170	180	160	170	E200A	E220A	230	E270S	280	230	E230A	E230A
215	200	190	E200S	E200S	180	180	170	180	E205A	225	S	S	C	220	E220S
210	200	180	E200A	180	180	180	E180B	200	E210A	240	E260S	E220S	E230A	E230A	200
210	210	200	200	185	E180B	180	180	180	E200S	E250S	250	U280F	U280F	U220F	E220S
210	200	E200B	190	E190S	185	180	E260S	E210S	E240S	E260S	E240S	E220S	E230S	E250A	E230A
250S	E250S	E300S	E240S	S	S	S	E250S	E210S	E240S	E250A	E250S	E240A	E250A	230	250
210	200	200	190	180	180	170	180	200	210	230	220	215	215	222	222
28	26	25	23	22	20	22	22	25	26	27	27	28	28	28	28
220	210	200	200	200	182	185	220	200	220	240	240	230	230	230	240
200	200	180	180	170	170	165	160	185	200	220	210	200	210	218	220
20	10	20	20	30	12	20	60	15	20	20	30	30	20	12	20

B

Characteristic: f_oF1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	1
1	-	-	-	-	-	-	-	-	L	L	043 *	045	043	042	0
2	-	-	-	-	-	-	-	-	L	L	042	A	A	A	0
3	-	-	-	-	-	-	-	-	L	A	A	A	A	A	
4	-	-	-	-	-	-	-	-	L	041	042	042	042	042	0
5	-	-	-	-	-	-	-	-	L	L	L	042	043	042	0
6	-	-	-	-	-	-	-	L	L	041	043	042	043	043	0
7	-	-	-	-	-	-	-	-	L	L	042	044	043	043	0
8	-	-	-	-	-	-	-	-	L	L	044	043	044	044	0
9	-	-	-	-	-	-	-	-	L	L	043	045	045	044	0
10	-	-	-	-	-	-	-	S	L	L	042	043	044	040	0
11	-	-	-	-	-	-	-	-	L	042	043	043	043	043	0
12	-	-	-	-	-	-	-	-	L	L	043	043	043	044	0
13	-	-	-	-	-	-	-	-	L	L	043	A	A	A	
14	-	-	-	-	-	-	-	-	L	042	043	045	044	043	0
15	-	-	-	-	-	-	-	-	L	L	043	044	043	044	0
16	-	-	-	-	-	-	-	-	L	041	042	043	041	044	0
17	-	-	-	-	-	-	-	-	-	041	042	042	B	043	
18	-	-	-	-	-	-	-	-	L	044	C	C	C	C	0
19	-	-	-	-	-	-	-	-	L	042	043	043	044	A	
20	-	-	-	-	-	-	-	-	A	A	A	A	A	A	
21	-	-	-	-	-	-	-	-	L	L	043	044	044	C	
22	-	-	-	-	-	-	-	-	L	042	043	044	043	043	0
23	-	-	-	-	-	-	-	-	L	A	A	A	L	A	0
24	-	-	-	-	-	-	-	-	L	042	044	045	045	044	
25	-	-	-	-	-	-	-	-	L	L	044	045	045	046	0
26	-	-	-	-	-	-	-	-	L	L	043	045	045	S	
27	-	-	-	-	-	-	-	-	L	L	044	046	045	046	
28	-	-	-	-	-	-	-	-	-	L	045	046	046	045	0
29	-	-	-	-	-	-	-	-	-	L	S	046	S	S	
30															
31															
Median	-	-	-	-	-	-	-	-	-	042	043	044	044	043	0
Count	-	-	-	-	-	-	-	-	-	10	23	23	21	19	
UQ	-	-	-	-	-	-	-	-	-	042	043	045	045	044	0
LQ	-	-	-	-	-	-	-	-	-	041	042	043	043	043	0
QR	-	-	-	-	-	-	-	-	-	1	1	2	2	1	

Tabulation of 043 = 4.3 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	L	043*	045	043	042	042	L	L	-	-	-	-	-	-	-
L	L	042	A	A	A	042	042	L	-	-	-	-	-	-	-
L	A	A	A	A	A	A	A	A	L	-	-	-	-	-	-
L	041	042	042	042	042	041	041	L	L	-	-	-	-	-	-
L	L	L	042	043	042	042	042	L	L	-	-	-	-	-	-
L	041	043	042	043	043	043	L	L	-	-	-	-	-	-	-
L	L	042	044	043	043	042	042	L	-	-	-	-	-	-	-
L	L	044	043	044	044	042	R	L	-	-	-	-	-	-	-
L	L	043	045	045	044	042	042	L	-	-	-	-	-	-	-
L	L	042	043	044	040	042	L	L	L	-	-	-	-	-	-
L	042	043	043	043	043	042	043	L	L	-	-	-	-	-	-
L	L	043	043	043	044	042	042	L	L	-	-	-	-	-	-
L	L	043	A	A	A	A	U042L	L	L	-	-	-	-	-	-
L	042	043	045	044	043	044	043	L	L	-	-	-	-	-	-
L	L	043	044	043	044	042	A	L	L	-	-	-	-	-	-
L	041	042	043	041	044	043	042	L	-	-	-	-	-	-	-
-	041	042	042	B	043	C	C	C	C	-	-	-	-	-	-
L	044	C	C	C	C	043	042	L	L	L	-	-	-	-	-
L	042	043	043	044	A	A	A	L	L	-	-	-	-	-	-
A	A	A	A	A	A	A	A	A	L	-	-	-	-	-	-
L	L	043	044	044	C	C	C	C	C	-	-	-	-	-	-
L	042	043	044	043	043	045	A	L	-	-	-	-	-	-	-
L	A	A	A	L	A	043	L	L	A	-	-	-	-	-	-
L	042	044	045	045	044	L	044	L	-	-	-	-	-	-	-
L	L	044	045	045	046	045	U043L	L	L	-	-	-	-	-	-
L	L	043	045	045	S	L	L	L	-	-	-	-	-	-	-
L	L	044	046	045	046	L	L	L	-	-	-	-	-	-	-
-	L	045	046	046	045	045	L	L	L	-	-	-	-	-	-
-	L	S	046	S	S	S	L	L	L	-	-	-	-	-	-
-	042	043	044	044	043	042	042	-	-	-	-	-	-	-	-
-	10	23	23	21	19	19	13	-	-	-	-	-	-	-	-
-	042	043	045	045	044	043	043	-	-	-	-	-	-	-	-
-	041	042	043	043	043	042	042	-	-	-	-	-	-	-	-
-	1	1	2	2	1	1	1	-	-	-	-	-	-	-	-

B

Characteristic: M(3000)F1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minu

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	-	-	-	-	-	-	-	L	L	410*	400	420	430
2	-	-	-	-	-	-	-	-	L	L	410	A	A	A
3	-	-	-	-	-	-	-	-	L	A	A	A	A	A
4	-	-	-	-	-	-	-	-	L	390	360	420	430	430
5	-	-	-	-	-	-	-	-	L	L	L	400	420	410
6	-	-	-	-	-	-	-	L	L	370	400	420	430	430
7	-	-	-	-	-	-	-	-	L	L	390	400	420	400
8	-	-	-	-	-	-	-	-	L	L	380	420	410	410
9	-	-	-	-	-	-	-	-	L	L	410	390	390	420
10	-	-	-	-	-	-	-	S	L	L	410	420	410	415
11	-	-	-	-	-	-	-	-	L	380	410	415	420	415
12	-	-	-	-	-	-	-	-	L	L	390	400	420	410
13	-	-	-	-	-	-	-	-	L	L	385	A	A	A
14	-	-	-	-	-	-	-	-	L	380	400	410	420	420
15	-	-	-	-	-	-	-	-	L	L	410	400	430	420
16	-	-	-	-	-	-	-	-	L	400	405	420	430	420
17	-	-	-	-	-	-	-	-	-	410	410	420	B	420
18	-	-	-	-	-	-	-	-	L	400	C	C	C	C
19	-	-	-	-	-	-	-	-	L	370	410	430	420	A
20	-	-	-	-	-	-	-	-	A	A	A	A	A	A
21	-	-	-	-	-	-	-	-	L	L	390	400	415	C
22	-	-	-	-	-	-	-	-	L	390	400	420	425	430
23	-	-	-	-	-	-	-	-	L	A	A	A	L	A
24	-	-	-	-	-	-	-	-	L	390	390	400	410	430
25	-	-	-	-	-	-	-	-	L	L	400	400	410	410
26	-	-	-	-	-	-	-	-	L	L	400	410	410	S
27	-	-	-	-	-	-	-	-	L	L	400	390	420	400
28	-	-	-	-	-	-	-	-	-	L	390	400	390	415
29	-	-	-	-	-	-	-	-	-	L	S	390	S	S
30														
31														
Median	-	-	-	-	-	-	-	-	-	390	400	400	420	420
Count	-	-	-	-	-	-	-	-	-	10	23	23	21	19
UQ	-	-	-	-	-	-	-	-	-	400	410	420	422	430
LQ	-	-	-	-	-	-	-	-	-	380	390	400	410	410
QR	-	-	-	-	-	-	-	-	-	20	20	20	12	20

*Tabulation of 410 = factor of 4.1.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	L	L	410*	400	420	430	410	L	L	-	-	-	-	-	-	-
-	L	L	410	A	A	A	400	380	L	-	-	-	-	-	-	-
-	L	A	A	A	A	A	A	A	A	L	-	-	-	-	-	-
-	L	390	360	420	430	430	420	390	L	L	-	-	-	-	-	-
-	L	L	L	400	420	410	410	375	L	L	-	-	-	-	-	-
L	L	370	400	420	430	430	390	L	L	-	-	-	-	-	-	-
-	L	L	390	400	420	400	420	390	L	-	-	-	-	-	-	-
-	L	L	380	420	410	410	410	R	L	-	-	-	-	-	-	-
-	L	L	410	390	390	420	400	380	L	-	-	-	-	-	-	-
S	L	L	410	420	410	415	420	L	L	L	-	-	-	-	-	-
-	L	380	410	415	420	415	420	380	L	L	-	-	-	-	-	-
-	L	L	390	400	420	410	420	390	L	L	-	-	-	-	-	-
-	L	L	385	A	A	A	A	U400L	L	L	-	-	-	-	-	-
-	L	380	400	410	420	420	400	390	L	L	-	-	-	-	-	-
-	L	L	410	400	430	420	430	A	L	L	-	-	-	-	-	-
-	L	400	405	420	430	420	410	390	L	-	-	-	-	-	-	-
-	-	410	410	420	B	420	C	C	C	C	-	-	-	-	-	-
-	L	400	C	C	C	C	420	420	L	L	L	-	-	-	-	-
-	L	370	410	430	420	A	A	A	L	L	-	-	-	-	-	-
-	A	A	A	A	A	A	A	A	A	L	-	-	-	-	-	-
-	L	L	390	400	415	C	C	C	C	C	-	-	-	-	-	-
-	L	3[illegible]	400	420	425	430	390	A	L	-	-	-	-	-	-	-
-	L	A	A	A	[illegible]	A	430	L	L	A	-	-	-	-	-	-
-	L	390	390	400	410	430	L	390	L	-	-	-	-	-	-	-
-	L	L	400	400	410	410	410	U400L	L	L	-	-	-	-	-	-
-	L	L	400	410	410	S	L	L	L	-	-	-	-	-	-	-
-	L	L	400	390	420	400	L	L	L	-	-	-	-	-	-	-
-	-	L	390	400	390	415	400	L	L	L	-	-	-	-	-	-
-	-	L	S	390	S	S	S	L	L	L	-	-	-	-	-	-
-	-	390	400	400	420	420	410	390	-	-	-	-	-	-	-	-
-	-	10	22	23	21	19	19	13	-	-	-	-	-	-	-	-
-	-	400	410	420	422	430	420	395	-	-	-	-	-	-	-	-
-	-	380	390	400	410	410	400	380	-	-	-	-	-	-	-	-
-	-	20	20	20	12	20	20	15	-	-	-	-	-	-	-	-

B

Characteristic: foE

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12
1	-	-	-	-	-	-	-	-	-	A	R	S	S
2	-	-	-	-	-	-	-	-	-	A	A	A	A
3	-	-	-	-	-	-	-	-	-	A	A	A	A
4	-	-	-	-	-	-	-	-	A	A	A	A	A
5	-	-	-	-	-	-	-	-	A	A	-	A	A
6	-	-	-	-	-	-	-	S	A	A	A	A	A
7	-	-	-	-	-	-	-	-	A	A	A	A	A
8	-	-	-	-	-	-	-	-	A	A	A	A	A
9	-	-	-	-	-	-	-	-	S	S	B	R	A
10	-	-	-	-	-	-	-	S	S	S	S	A	S
11	-	-	-	-	-	-	-	-	S	A	A	A	A
12	-	-	-	-	-	-	-	-	S	S	B	S	S
13	-	-	-	-	-	-	-	-	S	A	A	A	A
14	-	-	-	-	-	-	-	-	S	S	R	B	R
15	-	-	-	-	-	-	-	-	250	S	A	R	A
16	-	-	-	-	-	-	-	-	S	S	A	R	B
17	-	-	-	-	-	-	-	-	-	A	A	A	B
18	-	-	-	-	-	-	-	-	S	A	C	C	C
19	-	-	-	-	-	-	-	-	280	R	A	A	A
20	-	-	-	-	-	-	-	-	S	S	A	A	A
21	-	-	-	-	-	-	-	-	S	S	A	S	A
22	-	-	-	-	-	-	-	-	A	A	R	R	B
23	-	-	-	-	-	-	-	-	S	A	A	A	B
24	-	-	-	-	-	-	-	-	S	S	320	R	B
25	-	-	-	-	-	-	-	-	A	A	R	R	R
26	-	-	-	-	-	-	-	-	S	R	B	A	B
27	-	-	-	-	-	-	-	-	S	A	A	S	B
28	-	-	-	-	-	-	-	-	-	330	B	B	S
29	-	-	-	-	-	-	-	-	-	S	S	S	S
30													
31													
Median	-	-	-	-	-	-	-	-	265	330	320	-	-
Count	-	-	-	-	-	-	-	-	2	1	1	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-	-

*Tabulation of 300 = 3.0 Mc.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
February 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	A	R	S	S	R	R	A	A	-	-	-	-	-	-	-
	A	A	A	A	A	A	A	A	-	-	-	-	-	-	-
	A	A	A	A	A	A	A	A	A	-	-	-	-	-	-
	A	A	A	A	A	-	300*	280H	A	-	-	-	-	-	-
	A	-	A	A	A	A	A	A	B	-	-	-	-	-	-
	A	A	A	A	B	S	290	290	-	-	-	-	-	-	-
	A	A	A	A	A	B	300	B	-	-	-	-	-	-	-
	A	A	A	A	R	R	290H	S	-	-	-	-	-	-	-
	S	B	R	A	A	A	A	B	-	-	-	-	-	-	-
	S	S	A	A	S	B	B	A	-	-	-	-	-	-	-
	S	A	A	A	B	B	A	A	A	-	-	-	-	-	-
	S	B	S	A	S	B	B	290	A	-	-	-	-	-	-
	S	A	A	A	B	B	A	-	A	-	-	-	-	-	-
	S	R	B	R	S	B	B	A	A	-	-	-	-	-	-
0	S	A	R	A	A	B	A	A	A	-	-	-	-	-	-
	S	A	R	B	R	R	B	S	-	-	-	-	-	-	-
	A	A	A	B	B	C	C	C	C	-	-	-	-	-	-
0	R	C	C	C	C	B	S	A	S	S	-	-	-	-	-
	S	A	A	A	A	A	B	S	S	-	-	-	-	-	-
	S	A	A	A	A	S	S	A	A	-	-	-	-	-	-
	A	A	S	A	C	C	C	C	C	-	-	-	-	-	-
	A	R	R	A	B	B	B	B	-	-	-	-	-	-	-
	S	A	R	A	B	B	B	A	A	-	-	-	-	-	-
	A	320	R	R	R	B	S	S	-	-	-	-	-	-	-
	R	R	A	R	R	R	R	R	A	-	-	-	-	-	-
	A	B	A	S	B	B	B	S	-	-	-	-	-	-	-
	330	A	B	B	S	B	R	290	-	-	-	-	-	-	-
	S	B	S	S	R	B	S	S	S	-	-	-	-	-	-
		S	S	S	S	S	S	S	A	-	-	-	-	-	-
5	330	320	-	-	-	-	295	290	-	-	-	-	-	-	-
	1	1	-	-	-	-	4	4	-	-	-	-	-	-	-
	-	-	-	-	-	-	300	290	-	-	-	-	-	-	-
	-	-	-	-	-	-	290	285	-	-	-	-	-	-	-
	-	-	-	-	-	-	10	5	-	-	-	-	-	-	-

B

Characteristic: h'E

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	
1	-	-	-	-	-	-	-	-	-	A	100*	S	110	110	
2	-	-	-	-	-	-	-	-	-	A	A	A	S	A	
3	-	-	-	-	-	-	-	-	-	A	100	100	A	A	
4	-	-	-	-	-	-	-	-	100S	100	100	100	100	100	
5	-	-	-	-	-	-	-	-	A	100	100	100	A	A	
6	-	-	-	-	-	-	-	S	100	100	A	A	A	B	
7	-	-	-	-	-	-	-	-	A	A	A	A	A	A	
8	-	-	-	-	-	-	-	-	A	A	A	100	100	100	
9	-	-	-	-	-	-	-	-	S	S	B	100	A	A	
10	-	-	-	-	-	-	-	S	S	S	100	A	S	S	
11	-	-	-	-	-	-	-	-	100	100	100	100	100	B	
12	-	-	-	-	-	-	-	-	S	S	B	S	S	100	
13	-	-	-	-	-	-	-	-	S	A	A	A	A	B	
14	-	-	-	-	-	-	-	-	S	100	100	B	E105S	S	
15	-	-	-	-	-	-	-	-	100	100	104	100	A	A	
16	-	-	-	-	-	-	-	-	110	110	A	100	B	100	
17	-	-	-	-	-	-	-	-	-	A	A	A	B	B	
18	-	-	-	-	-	-	-	-	S	100	C	C	C	C	
19	-	-	-	-	-	-	-	-	100	100	100	100	100	A	
20	-	-	-	-	-	-	-	-	S	S	100	100	100	S	
21	-	-	-	-	-	-	-	-	110	110	100	S	100	C	
22	-	-	-	-	-	-	-	-	100	100	100	100	B	B	
23	-	-	-	-	-	-	-	-	S	A	A	100	B	B	
24	-	-	-	-	-	-	-	-	110	E110S	100	100	B	100	
25	-	-	-	-	-	-	-	-	A	A	105	100	100	100	
26	-	-	-	-	-	-	-	-	S	E110S	B	A	B	B	
27	-	-	-	-	-	-	-	-	S	100	100	S	B	B	
28	-	-	-	-	-	-	-	-	-	E160S	B	B	S	100	
29	-	-	-	-	-	-	-	-	-	S	S	S	S	S	
30															
31															
Median	-	-	-	-	-	-	-	-	100	100	100	100	100	100	
Count	-	-	-	-	-	-	-	-	9	15	15	14	9	8	
UQ	-	-	-	-	-	-	-	-	110	110	100	100	107	100	
LQ	-	-	-	-	-	-	-	-	100	100	100	100	100	100	
QR	-	-	-	-	-	-	-	-	10	10	0	0	7	0	

*Tabulation of 100 = 100 km.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	A	100*	S	110	110	100	100	110	-	-	-	-	-	-	-
-	A	A	A	S	A	A	A	A	-	-	-	-	-	-	-
-	A	100	100	A	A	A	A	A	100	-	-	-	-	-	-
100S	100	100	100	100	100	100	100	100	100	-	-	-	-	-	-
A	100	100	100	A	A	A	A	100	B	-	-	-	-	-	-
100	100	A	A	A	B	S	100	100	-	-	-	-	-	-	-
A	A	A	A	A	A	B	100	B	-	-	-	-	-	-	-
A	A	A	100	100	100	100	100	100	-	-	-	-	-	-	-
S	S	B	100	A	A	A	A	B	-	-	-	-	-	-	-
S	S	100	A	S	S	B	B	A	-	-	-	-	-	-	-
100	100	100	100	100	B	B	A	A	A	-	-	-	-	-	-
S	S	B	S	S	100	B	B	E110S	A	-	-	-	-	-	-
S	A	A	A	A	B	B	A	-	A	-	-	-	-	-	-
S	100	100	B	E105S	S	B	B	A	A	-	-	-	-	-	-
100	100	104	100	A	A	B	A	A	A	-	-	-	-	-	-
110	110	A	100	B	100	100	B	S	-	-	-	-	-	-	-
-	A	A	A	B	B	C	C	C	C	-	-	-	-	-	-
S	100	C	C	C	C	B	S	100	S	S	-	-	-	-	-
100	100	100	100	100	A	A	B	S	S	-	-	-	-	-	-
S	S	100	100	100	S	S	S	A	A	-	-	-	-	-	-
110	110	100	S	100	C	C	C	C	C	-	-	-	-	-	-
100	100	100	100	B	B	100	B	B	-	-	-	-	-	-	-
S	A	A	100	B	B	B	B	A	A	-	-	-	-	-	-
110	E110S	100	100	B	B	B	3	S	-	-	-	-	-	-	-
A	A	105	100	100	100	B	100	130	A	-	-	-	-	-	-
S	E110S	B	A	B	B	B	B	100	-	-	-	-	-	-	-
S	100	100	S	B	B	B	100	100	-	-	-	-	-	-	-
-	E160S	B	B	S	100	B	S	S	S	-	-	-	-	-	-
-	S	S	S	S	S	S	S	S	A	-	-	-	-	-	-
100	100	100	100	100	100	100	100	100	100	-	-	-	-	-	-
9	15	15	14	9	8	6	7	10	2	-	-	-	-	-	-
110	110	100	100	107	100	100	100	110	-	-	-	-	-	-	-
100	100	100	100	100	100	100	100	100	-	-	-	-	-	-	-
10	10	0	0	7	0	0	0	10	-	-	-	-	-	-	-

B

Characteristic: f_{bEs}

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minut

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	020*	-	-	S	S	S	025	030	034	S	S	S	S
2	B	S	B	B	B	S	S	022	028	033	034	052	050	044
3	S	B	S	S	022	-	S	S	028	042	045	-	052	050
4	020	-	017	B	B	-	S	S	029	029	039	034	035	034
5	S	S	B	B	B	018	S	M	026M	033	035	035	040	035
6	018	-	-	-	S	S	S	M	-	-	M	040	036	B
7	S	S	B	B	B	S	S	S	027	031	038	034	035	040
8	S	018	-	-	-	-	S	S	027	033	033	M	037	S
9	S	S	S	S	022	S	S	S	S	031	B	S	-	035
10	S	016	019	B	S	S	S	S	-	030	S	039	S	034
11	-	-	S	S	B	-	-	-	S	030	038	-	038	B
12	M	B	S	B	017	-	S	S	S	S	B	S	S	G
13	020	-	-	-	-	-	-	S	M	M	037	052M	060	050
14	-	023	027	-	019	-	S	B	B	S	S	B	S	S
15	S	S	B	B	B	-	S	-	S	S	033	S	037	-
16	S	-	-	B	B	-	S	S	S	S	033	S	B	S
17	S	-	012	015	-	-	S	C	C	032	027	035M	B	B
18	S	-	B	-	-	-	S	S	M	034	C	C	C	C
19	-	S	B	B	S	S	S	S	S	033	040	037	044	044
20	-	S	S	S	S	S	-	029M	034	050M	055M	057M	070M	055M
21	S	S	B	B	S	S	S	027	S	S	-	S	041	C
22	023	-	-	015	S	-	-	S	-	-	S	S	S	B
23	S	B	B	B	B	-	-	025M	032	040M	045M	054	050	050M
24	025	-	B	B	B	S	S	S	S	S	S	S	B	G
25	022	S	S	-	S	-	-	028	032	-	S	S	S	S
26	023	B	B	B	S	-	-	-	M	S	B	040	B	B
27	B	B	B	B	B	S	S	S	-	-	-	M	B	B
28	S	S	S	M	B	-	S	S	B	S	B	B	S	S
29	-	020	-	020	-	-	023	-	S	S	S	S	S	S
30														
31														
Median	022	020	018	015	021	018	023	026	028	033	038	040	041	04\
Count	7	5	4	3	4	1	1	6	10	15	14	12	14	11
UQ	023	021	023	018	022	-	-	028	032	034	040	052	050	050
LQ	020	017	015	015	018	-	-	025	027	031	033	035	037	035
QR	3	4	8	3	4	-	-	3	5	3	7	17	13	15

* Tabulation of 020 = 2.0 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

8	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
30	034	S	S	S	S	S	038	034	028	-	S	021	022	S	B
28	033	034	052	050	044	036	032	037	S	S	-	S	025	021	S
28	042	045	-	052	050	045	042	060	-	029	-	-	021	022	022
29	029	039	034	035	034	-	G	G	-	-	B	B	B	024	S
26M	033	035	035	040	035	034	032	030	-	S	S	S	040	034	-
-	-	M	040	036	B	035	S	G	S	S	S	020	-	027	B
27	031	038	034	035	040	B	G	B	S	S	B	B	025	-	020
27	033	033	M	037	S	S	G	G	B	S	S	B	-	M	-
3	031	B	S	-	035	038	037M	B	S	S	S	-	022	S	S
-	030	S	039	S	034	038	035	030	027	031	B	B	-	-	-
3	030	038	-	038	B	036	033	030	027	-	-	B	023	-	021
2	S	B	S	S	G	B	B	B	030	030	023	030	023	-	029
1	M	037	052M	060	050	063	039	030	027	026	025	027	037	027	S
3	S	S	B	S	S	B	B	032	024	S	S	022	B	S	S
3	S	033	S	037	-	B	040	-	030	030	-	028	B	S	B
3	S	033	S	B	S	S	B	S	S	022	025	-	-	-	-
M	032	027	035M	B	B	C	C	C	C	C	022	-	S	S	S
3	034	C	C	C	C	B	-	-	S	021	023	-	020	030	-
34	033	040	037	044	044	-	044M	033M	027	S	S	S	026M	023	-
3	050M	055M	057M	070M	055M	052M	049	043	025	025	S	S	B	-	-
-	S	-	S	041	C	C	C	C	C	C	C	-	-	-	030
-	-	S	S	S	B	-	049	032	B	B	S	S	-	-	S
32	040M	045M	054	050	050M	-	040	033	065	-	027	-	023	023	-
32	S	S	S	B	G	B	-	032	029	-	S	B	B	023	026
M	-	S	S	S	S	G	G	G	027	S	S	S	C	S	-
1	S	B	040	B	B	B	B	S	028	S	S	S	030	025	B
3	-	-	M	B	B	B	S	S	S	-	S	S	S	S	S
3	S	B	B	S	S	B	S	S	S	S	S	S	S	040	050
3	S	S	S	S	S	S	S	S	-	041	035	050	034	S	025
38	033	038	040	041	044	038	039	032	027	029	025	027	024	025	026
10	15	14	12	14	11	9	13	13	13	9	7	7	14	12	8
32	034	040	052	050	050	049	043	036	030	030	027	030	030	028	030
37	031	033	035	037	035	036	034	030	027	024	023	021	022	023	022
	3	7	17	13	15	13	9	6	3	6	4	9	8	5	8

B

Characteristic: f_0E_s

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	038 *	038	045	020	S	S	S	030	040	044	S	S	S	S
2	B	S	B	B	B	S	S	033	037	045	045	065	073	070M
3	S	B	S	S	035	028	S	S	039	053	060	150	087	068
4	029	028	025	B	B	019	S	S	034	043	045	044	039	035
5	S	S	B	B	B	018	S	026M	032M	037	043	044	045	044
6	033	024	021	020	S	S	S	023M	035	030	035M	045	045	B
7	S	S	B	B	B	S	S	S	037	034	040	040	045	046
8	S	026	021	017	070	040	S	S	035	043	037	045	055	S
9	S	S	S	S	031	S	S	S	S	031	B	S	030	045
10	S	026	028	B	S	S	S	S	032	037	S	045	S	034
11	026	026	S	S	B	047	027	026	S	034	038	038	038	B
12	082M	B	S	B	028	025	S	S	S	S	B	S	S	G
13	048	040	040	047	050	095	085	S	035M	035M	045	052M	069	056
14	027	035	045	035	065	046	S	B	B	S	S	B	S	S
15	S	S	B	B	B	027	S	034	S	S	045	S	040	040
16	S	040	029	B	B	020	S	S	S	S	036	S	B	S
17	S	028	020	021	065	047	S	C	C	034	032	045M	B	B
18	S	025	B	025	027	022	S	S	034M	034	C	C	C	C
19	025	S	B	B	S	S	S	S	S	033	040	037	050	068
20	041	S	S	S	S	S	027	045M	034	054M	060M	064M	073M	059M
21	S	S	B	B	S	S	S	028	S	S	034	S	041	C
22	035	023	019	020	S	024	027	S	029	031	S	S	S	B
23	S	B	B	B	B	019	021	029M	032	046M	051M	062	055	055M
24	042	020	B	B	B	S	S	S	S	S	S	S	B	G
25	030	S	S	016	S	026	020	032	041	027	S	S	S	S
26	032	B	B	B	S	026	035	035	033M	S	B	040	B	B
27	B	B	B	B	B	S	S	S	032	031	034	034M	B	B
28	S	S	S	026M	B	020	S	S	B	S	B	B	S	S
29	060	030	034	035	057	033	029	048	S	S	S	S	S	S
30														
31														
Median	034	028	028	021	050	026	027	031	034	034	040	045	045	050
Count	14	14	11	11	9	18	8	12	17	20	17	16	15	12
UQ	042	038	040	035	065	040	032	034	037	043	045	057	069	063
LQ	029	025	021	020	029	021	024	027	032	032	036	040	040	042
QR	13	13	19	15	36	19	8	7	5	11	9	17	29	21

* Tabulation of 038 = 3.8 Mc.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	044	S	S	S	S	S	038	034	039	028	S	029	027	S	B
7	045	045	065	073	070M	040	040	037	S	S	029	S	029	024	S
9	053	060	150	087	068	072	080	075	024	044	025	022	040	042	033
4	043	045	044	039	035	034	G	G	026	020	B	B	B	043	S
2M	037	043	044	045	044	057	047	030	025	S	S	S	045	057	026
5	030	035M	045	045	B	036	S	G	S	S	S	026	041	035	B
7	034	040	040	045	046	B	G	B	S	S	B	B	068	070	020
5	043	037	045	055	S	S	G	G	B	S	S	B	027	045M	026
	031	B	S	030	045	047	045M	B	S	S	S	022	025	S	S
2	037	S	045	S	034	038	042M	037	055	040	B	B	026	057	030
	034	038	038	038	B	036	034	044	040	045	034	B	028	037	080
	S	B	S	S	G	B	B	B	055	065	040	036	061	038	055
5M	035M	045	052M	069	056	077	049	038	037	034	044	038	070	044	S
	S	S	B	S	S	B	B	038	032	S	S	029	B	S	S
	S	045	S	040	040	B	057	047	045	045	030	028	B	S	B
	S	036	S	B	S	S	B	S	S	040	026	022	031	037	026
	034	032	045M	B	B	C	C	C	C	C	028	022	S	S	S
4M	034	C	C	C	C	B	031	028	S	021	027	023	035	035	025
	033	040	037	050	068	070	085M	040M	027	S	S	S	033M	043	035
4	054M	060M	064M	073M	059M	055M	052	055	036	037	S	S	B	030	027
	S	034	S	041	C	C	C	C	C	C	C	020	043	035	040
9	031	S	S	S	B	035	053	032	B	B	S	S	024	024	S
2	046M	051M	062	055	055M	046	045	036	085	034	045	035	045	045	065
	S	S	S	B	G	B	032	032	037	035	S	B	B	045	050
1	027	S	S	S	S	G	G	G	029	S	S	S	C	S	030
3M	S	B	040	B	B	B	B	S	037	S	S	S	046	045	B
2	031	034	034M	B	B	B	S	S	S	045	S	S	S	S	S
	S	B	B	S	S	B	S	S	S	S	S	S	S	045	085
	S	S	S	S	S	S	S	S	035	058	035	090	045	S	046
4	034	040	045	045	050	046	045	037	037	040	030	027	028	043	033
7	20	17	16	15	12	13	15	15	17	15	11	14	20	21	17
7	043	045	057	069	063	063	053	044	042	045	040	035	045	045	052
2	032	036	040	040	042	036	038	032	028	034	027	022	038	035	026
	11	9	17	29	21	27	15	12	14	11	13	13	7	10	26

B

Characteristic: h'Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	110*	110	110	115	S	S	S	115	110	100	S	S	S	S	S
2	B	S	B	B	B	S	S	110	100	100	102	100	100	100	100
3	S	B	S	S	090	090	S	S	100	100	100	100	100	100	100
4	100	090	095	B	B	110	S	S	110	100	100	100	115	110	100
5	S	S	B	B	B	110	S	115	100	110	100	100	100	100	100
6	090	090	090	090	S	S	S	140	140	135	100	100	100	B	105
7	S	S	B	B	B	S	S	S	100	100	100	100	090	090	B
8	S	100	100	100	104	102	S	S	105	100	100	100	100	S	S
9	S	S	S	S	090	S	S	S	S	150	B	S	095	090	090
10	S	090	090	B	S	S	S	S	110	100	S	100	S	115	110
11	100	100	S	S	B	100	100	090	S	140	130	130	120	B	110
12	100	B	S	B	090	090	S	S	S	S	B	S	S	G	B
13	105	105	110	100	100	100	100	S	150	100	100	115	110	100	100
14	090	100	100	100	100	100	S	B	B	S	S	B	S	S	B
15	S	S	B	B	B	100	S	100	S	S	100	S	100	100	B
16	S	100	100	B	B	090	S	S	S	S	100	S	B	S	S
17	S	100	100	100	100	100	S	C	C	100	100	100	B	B	C
18	S	100	B	100	100	100	S	S	150	140	C	C	C	C	B
19	100	S	B	B	S	S	S	S	S	130	120	120	110	100	100
20	140	S	S	S	S	S	120	120	120	120	110	110	100	100	100
21	S	S	B	B	S	S	S	110	S	S	140	S	120	C	C
22	090	095	095	090	S	100	100	S	150	150	S	S	S	B	130
23	S	B	B	B	B	120	120	120	120	120	110	105	100	100	100
24	100	100	B	B	B	S	S	S	S	S	S	S	B	G	B
25	090	S	S	100	S	100	100	090	085	080	S	S	S	S	G
26	100	B	B	B	S	100	100	100	150	S	B	090	B	B	B
27	B	B	B	B	B	S	S	S	115	120	110	100	B	B	B
28	S	S	S	100	B	100	S	S	B	S	B	B	S	S	B
29	100	110	100	100	100	100	100	110	S	S	S	S	S	S	S
30															
31															
Median	100	100	100	100	100	100	100	110	110	105	100	100	100	100	100
Count	14	14	11	11	9	18	8	12	17	20	17	16	15	12	13
UQ	100	100	100	100	100	100	110	117	145	132	110	107	110	100	107
LQ	090	095	095	100	090	100	100	100	100	100	100	100	100	100	100
QR	10	5	5	0	10	0	10	17	45	32	10	7	10	0	7

* Tabulation of 110 = 110 km.

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10	100	S	S	S	S	S	160	135	110	115	S	100	100	S	B
00	100	102	100	100	100	100	100	100	S	S	100	S	100	098	S
00	100	100	100	100	100	100	100	100	150	120	110	120	115	100	090
10	100	100	100	115	110	100	G	G	140	120	B	B	B	110	S
00	110	100	100	100	100	100	100	140	140	S	S	S	100	100	090
10	135	100	100	100	B	105	S	G	S	S	-	115	110	100	B
00	100	100	100	090	090	B	G	B	S	S	B	B	100	100	100
05	100	100	100	100	S	S	G	G	B	S	S	B	110	100	110
	150	B	S	095	090	090	090	B	S	S	S	130	100	S	S
10	100	S	100	S	115	110	105	100	105	105	B	B	110	100	100
	140	130	130	120	B	110	100	100	100	105	100	B	100	115	100
	S	B	S	S	G	B	B	B	085	090	090	085	120	120	110
00	100	100	115	110	100	100	090	090	090	080	080	090	100	100	S
	S	S	R	S	S	B	B	100	100	S	S	100	B	S	S
	S	100	S	100	100	B	100	100	090	090	085	090	B	S	B
	S	100	S	B	S	S	B	S	S	085	090	120	110	105	100
	100	100	100	B	B	C	C	C	C	C	090	100	S	S	S
00	140	C	C	C	C	B	120	100	S	130	100	120	105	100	100
	130	120	120	110	100	100	100	100	100	S	S	S	130	100	120
20	120	110	110	100	100	100	100	100	100	100	S	S	B	110	105
	S	140	S	120	C	C	C	C	C	C	C	100	090	100	095
50	150	S	S	S	B	130	120	100	B	B	S	S	120	110	S
20	120	110	105	100	100	100	100	100	100	100	120	100	110	100	100
	S	S	S	B	G	B	110	100	100	100	S	B	B	100	100
35	080	S	S	S	S	G	G	G	105	S	S	S	C	S	100
50	S	B	090	B	B	B	B	S	100	S	S	S	100	090	B
15	120	110	100	B	B	B	S	S	S	100	S	S	S	S	S
3	S	B	B	S	S	B	S	S	S	S	S	S	S	100	100
3	S	S	S	S	S	S	S	S	100	100	100	100	100	S	100
10	105	100	100	100	100	100	100	100	100	100	090	100	105	100	100
17	20	17	16	15	12	13	15	15	17	15	11	14	19	21	17
15	132	110	107	110	100	107	110	100	110	115	100	120	110	107	102
00	100	100	100	100	100	100	100	100	100	090	090	100	100	100	100
15	32	10	7	10	0	7	10	0	10	25	10	20	10	7	2

B

Characteristic: Type of Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minu

February 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour / Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	f	f	f2	f	–	–	–	f	ℓ	ℓ	–	–	–	–
2	–	–	–	–	–	–	–	f	ℓ	ℓ	ℓ	ℓ3	c2	ℓ
3	–	–	–	–	f3	f	–	–	ℓ	ℓ2	c2	c3	ℓ3	ℓ2
4	f	f	f	–	–	f	–	–	c	c	c	c	c	c
5	–	f	–	–	–	f	–	f	ℓ	c	c	c	ℓ2	ℓ
6	f	f2	f	f	–	–	–	h	h	h	ℓ	ℓ	ℓ	–
7	–	–	–	–	–	–	–	–	ℓ	ℓ	ℓ	ℓ	ℓ	ℓ2
8	f	f2	f	f	f	f	–	–	ℓ	ℓ	ℓ	ℓc	ℓc	–
9	–	–	–	f	f	–	–	–	–	h	–	–	ℓ	ℓ
10	f	f4	f	–	–	–	–	–	c	c	–	ℓ	–	c
11	f	f	–	–	–	f2	f	f	–	h	h	h	c	h
12	f3	–	–	–	f	ℓ	–	–	–	–	–	–	–	–
13	f2	f	f	f	ℓ2	f8	f3	f	h	ℓh	ℓh	cℓ	c3ℓ	c2
14	f	f7	f3	f	f2	f4	–	–	–	–	–	–	–	–
15	–	–	f	–	–	f3	–	f	–	–	ℓ	–	ℓ	ℓ
16	–	f	f	–	–	f	–	–	–	–	ℓ	–	–	–
17	–	f	f	f	f6	f4	–	–	–	ℓ	ℓ	ℓ	–	–
18	f	f	–	f	f	f	–	–	h	h	–	–	–	–
19	f	–	–	–	–	–	–	–	–	h	c	c	c	c2
20	f	–	–	–	–	–	f	f	c	c	c	c	c2	c2
21	–	–	–	–	–	–	–	f	–	–	h	–	c	–
22	f6	f	f2	f	–	f	f	–	h	h	–	–	–	–
23	f	–	–	–	f	f	f	f	c	c	c	c2	c	c
24	f2	f	–	–	–	–	f	–	–	–	–	–	–	–
25	f	–	–	f	–	f	f	f3	ℓ3	ℓ	–	–	–	–
26	f	–	–	–	–	f	f3	f	h	–	–	ℓ	–	–
27	–	–	–	–	–	–	–	–	c	cℓ	c	c	–	–
28	–	–	–	f	–	f2	–	–	–	–	–	–	–	–
29	f3	f2	f	f2	f2	f	f	f	–	–	–	–	–	–
30														
31														
Median	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Count	–	–	–	–	–	–	–	–	–	–	–	–	–	–
UQ	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LQ	–	–	–	–	–	–	–	–	–	–	–	–	–	–
QR	–	–	–	–	–	–	–	–	–	–	–	–	–	–

A

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

February 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
ℓ	ℓ	-	-	-	-	-	h	h	f	f	-	f2	f	-	f
ℓ	ℓ	ℓ	ℓ3	c2	ℓ	ℓ	ℓ	ℓ	-	-	f2	-	f	f	-
ℓ	ℓ2	c2	c3	ℓ3	ℓ2	ℓ2	ℓ2	ℓ3	h	f	f	f	f	f	f
c	c	c	c	c	c	c	-	-	h	f	-	-	-	f	-
ℓ	c	c	c	ℓ2	ℓ	ℓ	ℓ	h	h	-	-	-	f2	f5	f2
h	h	ℓ	ℓ	ℓ	-	c	-	-	-	-	-	f	f	f	-
ℓ	ℓ	ℓ	ℓ	ℓ	ℓ2	-	-	ℓ	-	-	-	-	f3	f5	f3
ℓ	ℓ	ℓ	ℓc	ℓc	-	-	-	-	-	-	-	-	f	f	f
-	h	-	-	ℓ	ℓ	ℓ	ℓ	-	-	-	-	f	f	-	-
c	c	-	ℓ	-	c	c	c	cℓ	cℓ	f2	-	-	f	f2	f
-	h	h	h	c	h	c	cℓ	ℓ	ℓ	f	f	-	f	f	f3
-	-	-	-	-	-	-	c	-	ℓ2	f2	f	f2	f	f	f
h	ℓh	ℓh	cℓ	c3ℓ	c2	c2	ℓ2	ℓ	ℓ	f2	f	f	f2	f	-
-	-	-	-	-	-	-	-	ℓ	ℓ	-	-	f	-	-	-
-	-	ℓ	-	ℓ	ℓ	ℓ	ℓ	ℓ	ℓ	f3	f	f	-	-	-
-	-	ℓ	-	-	-	-	-	-	-	f	f	f	f	f	f
-	ℓ	ℓ	ℓ	-	-	-	-	-	-	-	f	f	-	-	-
h	h	-	-	-	-	-	c	c	-	h	f	f	f	f2	f
-	h	c	c	c	c2	c2	c2	c	c	-	-	-	f	f3	f
c	c	c	c	c2	c2	c	c2	ℓ2	ℓ	f	-	-	-	f	f
-	-	h	-	c	-	-	-	-	-	-	-	f	f	f	f5
h	h	-	-	-	-	h	c	c	-	-	-	-	f	f	f
c	c	c	c2	c	c	c	ℓ	ℓ	ℓ	f	f	f	f2	f	f6
-	-	-	-	-	-	-	c	c	f	f	-	-	-	f	f
ℓ3	ℓ	-	-	-	-	-	-	-	ℓ	-	-	-	-	ℓ	f
h	-	-	ℓ	-	-	-	-	-	f	-	-	-	f	f	f
c	cℓ	c	c	-	-	-	-	-	-	f	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	f3	f3
-	-	-	-	-	-	-	c	-	ℓ	f2	f	f5	f	-	f2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MEDIAN VALUES FEBRUARY 1964

Hour Local	fmin (Mc)	foF2 (Mc)	M(3000)F2	h'F2 (km)	h'F (km)	foF1 (Mc)	M(3000)F1	foE (Mc)	h'E (km)	fbEs (Mc)	foEs (Mc)	h'Es (km)
00	1.6	4.9	3.50	-	220	-	-	-	-	2.2	3.4	100
01	1.6	4.5	3.60	-	215	-	-	-	-	2.0	2.8	100
02	1.6	3.7	3.70	-	210	-	-	-	-	1.8	2.8	100
03	1.5	3.0	3.60	-	210	-	-	-	-	1.5	2.1	100
04	1.4	2.4	3.60	-	215	-	-	-	-	2.1	5.0	100
05	1.7	2.2	3.60	-	235	-	-	-	-	1.8	2.6	100
06	1.8	2.3	3.40	-	275	-	-	-	-	2.3	2.7	100
07	2.3	4.6	3.50	-	220	-	-	-	-	2.6	3.1	110
08	2.5	6.4	3.35	-	210	-	-	2.65	100	2.8	3.4	110
09	2.3	7.1	3.15	300	200	4.2	3.90	3.30	100	3.3	3.4	105
10	2.7	7.5	2.90	305	200	4.3	4.00	3.20	100	3.8	4.0	100
11	2.9	7.5	2.80	320	190	4.4	4.00	-	100	4.0	4.5	100
12	3.0	7.0	2.70	330	180	4.4	4.20	-	100	4.1	4.5	100
13	3.0	6.8	2.70	340	180	4.3	4.20	-	100	4.4	5.0	100
14	3.3	7.4	2.70	330	170	4.2	4.10	-	100	3.8	4.6	100
15	3.0	7.5	2.90	310	180	4.2	3.90	2.95	100	3.9	4.5	100
16	2.5	7.5	3.00	295	200	-	-	2.90	100	3.2	3.7	100
17	2.3	7.7	3.10	320	210	-	-	-	100	2.7	3.7	100
18	1.9	7.6	3.05	-	230	-	-	-	-	2.9	4.0	100
19	1.9	7.1	3.30	-	220	-	-	-	-	2.5	3.0	090
20	1.8	6.8	3.50	-	215	-	-	-	-	2.7	2.7	100
21	1.8	5.9	3.40	-	215	-	-	-	-	2.4	2.8	105
22	1.8	5.6	3.40	-	222	-	-	-	-	2.5	4.3	100
23	1.8	4.7	3.50	-	222	-	-	-	-	2.6	3.3	100

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS
BANGKOK, THAILAND
FEBRUARY 1964

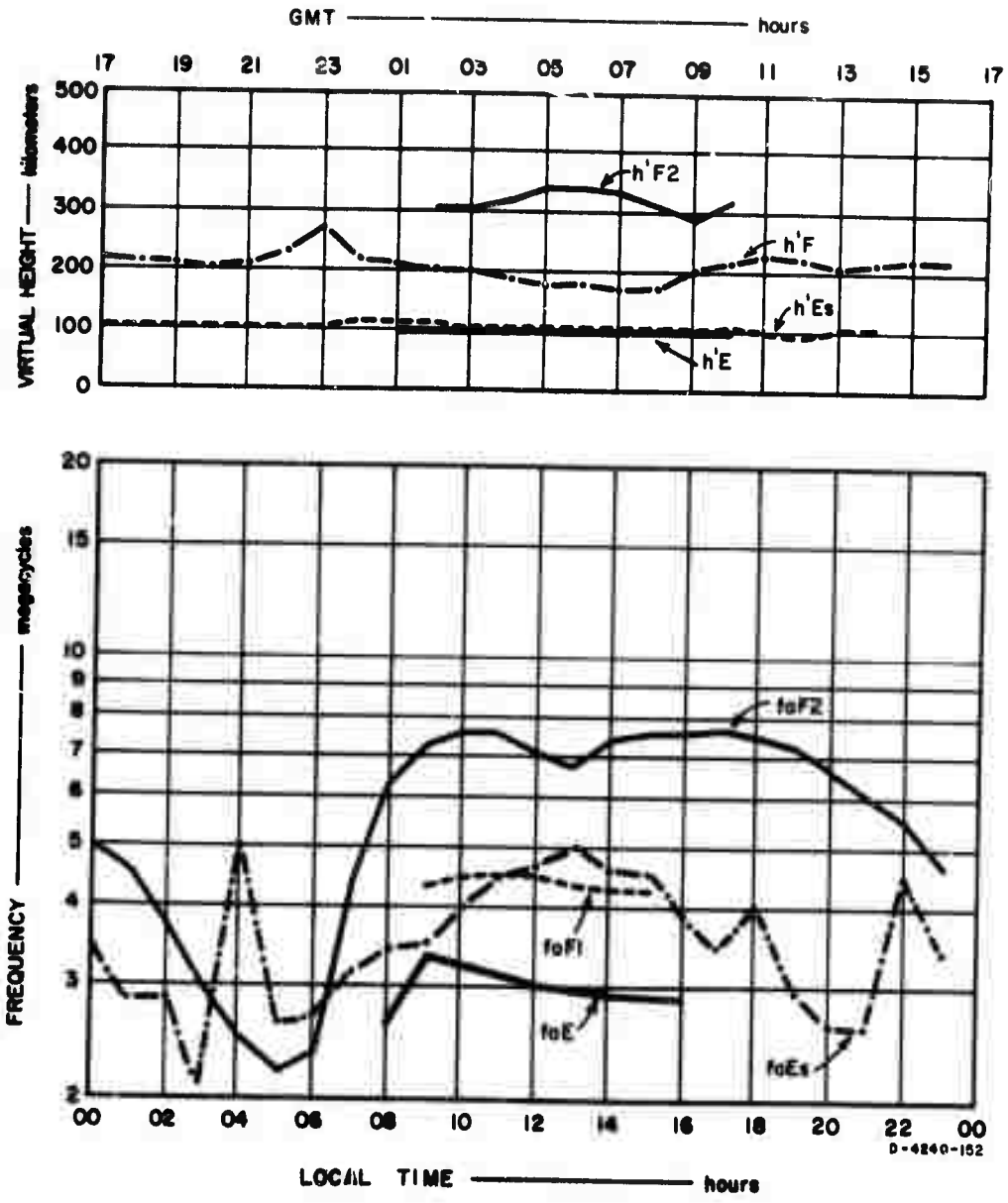

FIG. 1 SUMMARY GRAPHS

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